Fiber Allocation (Forero)

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1 Overview

Assigns fibers to galaxy targets in the sky. It takes as inputs a set of galaxies and fibers and returns a match fiber-galaxy. The fibers are arranged in an hexagonal tile.

1.1 Languages

Python

1.2 In Context

1.3 Open Issues for Development

- The code assumes a flat sky.

- Option for reading the galaxy positions from an external file has to be implemented

- Option for writing to disk the match fiber-galaxy has to be implemented

- Include the priority information of different galaxy populations into the matching routine.

2 INputs/Outputs

Required inputs to construct the fibers are:

- fiber_pitch (scalar, float) default 0.01. fiber pitch in degrees

- Ndiameter (scalar, integer) default 73. Number of fibers along the major axis in the hexagonal tile

- center_x (scalar, float) default 0.0. Position of the central fiber in the x-direction

- center_y (scalar, float) default 0.0. Position of the central fiber in the y-direction

Required inputs to construct a mock catalog of galaxies are:

- radius_fov (scatlar, float) default 3.0. The radius in degrees of the area covered by the galaxies.

- Ngalaxies (scalar, integer) default 1000. The number of galaxies in the catalog.

- priority_levels (scalar, integer) default 3. The number of different priority levels from 0 to (priority_levels-1)

The matching routine takes as inputs

- The Fibers as constructed in the class FiberSet

- The Galaxies as constructed in the class MockGalaxyCatalog

- epsilon (scalar, float) default 0.1. The radius around which the fibers look for galaxies. This is set to the fiber_pitch value.

3 Function Layout

3.1 User-defined functions

- class FiberSet

- class MockGalaxyCatalog

- function close_match_xy

- function reset_fiber_collisions

- function make_fiber_allocation

3.2 Modules required

- numpy

- sys

4 Code Procedure

5 Execution

Currently the code can be executed as

1. Creates a set of fibers: fibers = FiberSet(Ndiameter=73, fiber_pitch=0.1)

2. Creates a set of galaxies: gals = MockGalaxyCatalog(Ngalaxies=50000, radius_fov=fibers.radius, priority_levels=3) ; only needed if no catalog available.

3. Runs the fiber allocation: make_fiber_allocation(fibers, gals, tile_visit_ID=340)